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Foreign Agriculture

ON AN ISRAELI COLLECTIVE SETTLEMENT (SEE PAGE 95)

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Foreign Agriculture

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FRONT COVER

Farming for the Urban Market in Israel

Collective settlements like Kibbutz Givat-Brenner, near Tel Aviv, use intensive farming methods to help supply Israel's cities with dairy products, poultry and eggs, and vegetables and fruits. Efforts are being made to increase production of field crops; and farm-grown fodder now supplies more than 70 percent of requirements. But for bread grain and sugar, Israel must still rely largely on imports. See story on page 94. (Photo courtesy of Embassy of Israel.)

Credit for photos is given as follows: pp. 94-95, Embassy of Israel; p. 97, courtesy of Dr. L. E. Samuel.

BACK COVER

Agricultural Production In Asia and the Middle East

In both Asia and the Middle East, total agricultural production is higher than it was before the war, in 1935-39. But population has increased even more than production, with the result that per capita production is still fairly low: in the Far East it remains below the prewar average; in the Middle East, it barely tops it.

NEWS NOTE

Gwynn Garnett Appointed FAS Administrator

Gwynn Garnett is now administrator of the Foreign Agricultural Service, having assumed the duties of that position on April 15. He succeeds William G. Lodwick, who will become U. S. Agricultural Attaché to Mexico.

Mr. Garnett has had long experience in agricultural work. Since the war, he had been particularly active in programs and policies influencing foreign agricultural development and trade. He has held important United States agricultural positions in Western Europe and has traveled extensively in the Far East.

Until his recent appointment, he had been for 5 years director of foreign trade development for the American Farm Bureau Federation.

FOREIGN AGRICULTURE ALICE FRAY NELSON, EDITOR

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Marketing U. S. Dairy and Poultry Products Abroad

Because of the importance of foreign markets to our dairy and poultry industry, FAS marketing specialists have been particularly busy promoting increased consumption abroad of nonfat dry milk solids, butter, ghee and anhydrous milk fat (sometimes called butter oil), eggs, baby chicks, and other products of that industry.

We have not been exporting nearly as much of these products as we would like, but their importance in the world market now is indicated by the fact that during 1954 we exported through commercial channels nearly 3.5 million pounds of butter, more than 3 million pounds of cheese, and 199 million pounds of nonfat dry milk solids. These figures represent a remarkable increase over exports in 1935-39, when an average of nearly 1.4 million pounds of butter, almost 1.3 million pounds of cheese, and 6 million pounds of dried milk were exported. In addition to the commercial exports in 1954, about 63 million pounds of butter, about 43 million pounds of cheese, and about 165 million pounds of dried milk went abroad for relief purposes. In 1954, too, we exported over 15 million baby chicks, nearly 14 million pounds of fresh and frozen poultry, and 47 million dozen eggs in shell.

Dairy Products

In the list of dairy products we are shipping abroad is ghee. It is a product that results from the removal of moisture from butter by a boiling process, and has been a basic food in the Far East and Middle East for centuries. It is a light color, has a granular consistency resulting from slow cooling, and contains over 99 percent fat. It is not to be confused with butter oil, and does not require refrigeration.

When one of our representatives, Irving C. Reynolds, reported a substantial potential market for ghee in the Far East, we sent a marketing specialist, Louis H. Burgwald, to Asia to study methods of manufacture and factors that would be involved in selling ghee manufactured in this country. Ghee seemed to us an excellent potential outlet for our surplus butter. At the same time, we told the American dairy industry about our findings, and a number of dairy firms have been working to perfect a ghee acceptable to the Asian people. Now, word comes from India that a substantial shipment has been requested. And late in March it was announced that Pakistan would buy 4 million pounds.

To Latin America, we sent another marketing specialist, David R. Strobel, to explore the possibilities of selling nonfat dry milk solids and anhydrous milk fat in that milk-deficient area. These products are what is left of milk when the water is removed. They can be shipped without refrigeration and put back together with water to provide a fluid milk that cannot be distinguished in taste from, and has the nutritional value of, fresh milk.

Mr. Strobel found that private industry and government officials in Latin America were interested in supplementing normal milk supplies during the season of short supply and in establishing plants to produce recombined milk in areas where local production cannot provide adequate milk.

Promotion of foreign demand for ghee and recombined milk alone cannot be expected to dispose of the surplus dairy products we now have on hand. It could, however, minimize future surpluses and eventually even necessitate expansion of production in the United States.

Poultry Products

Another recent study in Latin America by a marketing specialist, Herbert W. Ford, yielded information needed particularly by our exporters of baby chicks and eggs. Latin America has long been a major market for our eggs and other poultry products, but since World War II importers there have been buying more and more baby chicks and hatching eggs and less dressed poultry.

Mr. Ford found extensive demand in Cuba for United States hatching eggs, of both purebred and hybrid stock, to build flocks for the production of eggs rather than broilers. One of the results of his trip was a union of effort by the United States and

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From an address by Gustave Burmeister, Assistant Administrator for Market Development, FAS, before the Annual Convention of the Pacific Dairy and Poultry Association, Salt Lake City, Utah.

importers in Colombia to prevail upon the Colombian Government to lift a ban that tends to discriminate against imports of United States eggs on sanitary grounds.

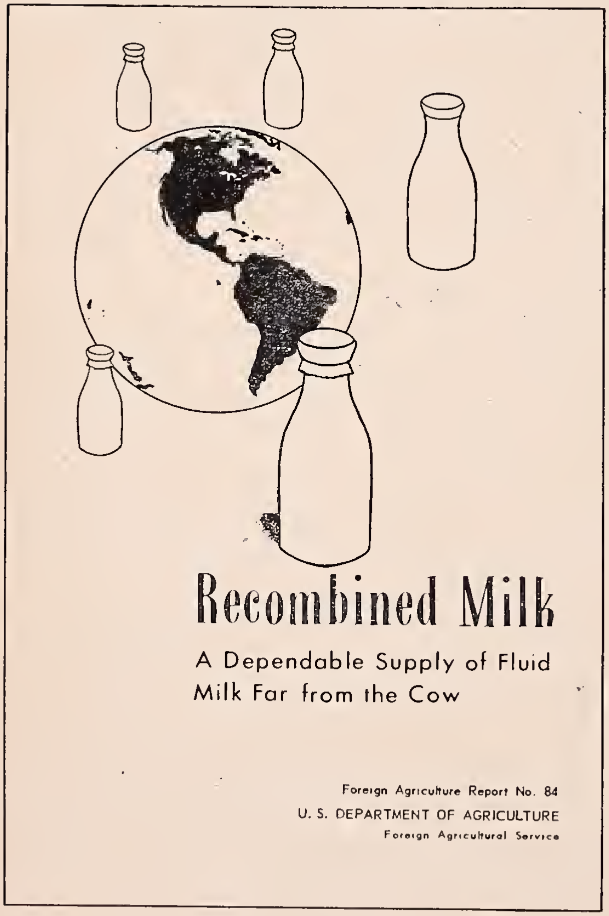
In Europe, our W. Dewey Termohlen and two U. S. poultry producers and marketers, Arlo Turner and Homer Huntington, conferred with leading British, Swiss, and West German poultrymen and government officials and brought back much information to exporters on import permits, sanitary regulations, and marketing opportunities.

One result of their work is that the United Kingdom may take $250,000 worth of canned poultry from us this year instead of $100,000, the amount estimated earlier. They also report that Switzerland could be made a desirable poultry market through an intensive promotional campaign. And they received a commitment from West German importers to urge the German Government to put eggs and poultry on the free exchange list, and to request egg and poultry imports to be paid for with German currency.

New FAS Release: Recombined Milk

"People in areas without a dairy industry sufficiently developed to meet their needs can get fluid milk today because science has learned to do these two things: To take milk apart so that the solid components can be shipped without refrigeration, and to put milk together again, into a product that cannot be distinguished from fresh fluid milk.

"That product is recombined milk, made from dry skim milk and anhydrous milk fat (frequently called butter oil)."



Recombined Milk

A Dependable Supply of Fluid
Milk Far from the Cow

Foreign Agriculture Report No. 84
U. S. DEPARTMENT OF AGRICULTURE
Foreign Agricultural Service

Thus begins Foreign Agriculture Service's new 20-page publication on recombined milk, Foreign Agriculture Report No. 84, by D. R. Strobel and C. J. Babcock of the Livestock and Livestock Products Division.

The report is a how-to-do-it publication. It describes plant layout and stresses the importance of plant sanitation; it lists the equipment needed for recombining milk, and tells what the plant can produce and how a market for milk and milk products can be developed; it discusses the financing of a recombining enterprise and the outlook for assuring a supply of dry skim milk and anhydrous milk fat; and it emphasizes technical competence in plant management and employees and mentions several organizations that are equipped to be of assistance.

In the appendix are instructions for preparing skim milk, whole milk, chocolate skim milk, chocolate milk, and ice cream; from the tables presented, processors can obtain information about the quantities of ingredients required to produce specific recombined products. In the appendix, too, is a section on the approximate cost of plant installations; here there is given estimated total cost of plant, machinery, and equipment for plants of three sizes, as well as the capacity and the approximate weight and size of the equipment needed.

The publication is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 15 cents.

Members of ISTA gather for their 10th and latest international meeting, held in Dublin, Ireland, in 1953. The association meets every 3 years; the next meeting is planned for Paris.

International Seed Testing Association

By W. A. DAVIDSON

The United States has a twofold interest in quality standards for seed that moves in international commerce, for it is both an importer and exporter of seed. For example, in 1953 we sold abroad about 48 million pounds of 17 kinds of forage crop seed, and in recent years we have been importing around 100 million pounds of agricultural and vegetable seed annually.

The seed that we import must meet a minimum standard of quality, set out in the Federal Seed Act; nevertheless, most importers like to trade in seed of even higher quality, as determined by tests in seed laboratories.

Laboratory tests are helpful to our seed exporters, too, since importers in the rest of the world also want to know what quality of seed they are buying. After all, the real value of seed has to be measured in the same way everywhere: in terms of the acres it will sow and the crop it will produce.

Establishing standards for measuring and expressing quality of seed that moves in world commerce is the primary job of the International Seed Testing Association (ISTA).

The association was organized in 1924, at a meeting in Cambridge, England, of representatives from 26 countries. It is an expansion of an organization created in 1906—the European Seed Testing Association.

The object of the association is ". . . to further all matters connected with accurate and uniform methods in testing and evaluating seeds in order to facilitate efficiency in production, processing, distribution, and utilization of seeds to be used for sowing."

This objective is accomplished through—

(a) the adoption of uniform methods and terminology,

(b) the conducting of comparative tests and research to improve the technique,

(c) the holding of congresses for mutual deliberation and exchange of information, and

(d) the publication of proceedings.

Members of the association are government-accredited persons engaged in seed testing or its

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Mr. Davidson is Chief, Seed Branch, Grain Division, AMS, and President, International Seed Testing Association.

technical control. Today's membership represents about 30 countries. Annual membership dues are assessed on the basis of the number of official seed testing stations in the member country. The United States contributes less than $300 annually. Meetings have been held at 3-year intervals except for the period 1937 to 1950. In 1950 the first meeting of the association in the United States was held; 32 countries were represented. The association last met in Dublin, Ireland, in 1953, and plans to meet in Paris in 1956.

In keeping with the broad general movement to encourage international cooperation after World War II, the association considered affiliating with the Food and Agriculture Organization of the United Nations (FAO). It decided, however, to continue as an independent organization, but approved a 6-point cooperative relationship with FAO as follows:

"(1) *Collaboration:* It is proposed that there be collaboration on technical matters between I.S.T.A. and F.A.O. through Committee Chairmen or Officers of I.S.T.A. as liaison officers for I.S.T.A. to make direct contact with the seed specialists of F.A.O.

"(2) *Nomenclature:* It is proposed that the Committee on Nomenclature of I.S.T.A. collaborate with F.A.O. to effect greater uniformity and a better understanding of the common and scientific names used for species of crops and weeds throughout the world.

"(3) *Technical Assistance:* F.A.O. is carrying on a program of providing technical assistance where persons from under-developed countries may study to obtain technical training in seed technology. I.S.T.A. should also be informed about which qualified Stations would be able to receive persons for such training, and the time when such training could be given most conveniently. Any further necessary detailed arrangements involving entry into the Country, Visa, and diplomatic arrangements should be made by F.A.O.

"(4) *Plant Quarantines:* F.A.O. is carrying on a program designed to restrict the dissemination of plant diseases. There is need for cooperation with seed testing stations to carry out that part of the program which pertains to seed-borne diseases.

"(5) *International Certificates:* I.S.T.A. has sponsored International Certificates to accompany seed in International Commerce. The Certificates have in the past been available through the Secretary of I.S.T.A. No definite decision was made with respect to the future of the I.S.T.A. plans pertaining to International Certificates. However, it was proposed that the Certificates be regarded by members, as well as by non-member countries, as a model certificate to be used to accompany seed in International Commerce. To foster orderly trading in seeds it is proposed that all countries engaged in International Commerce in Seeds be encouraged by F.A.O. to use International Certificates or models thereof.

"(6) *Publications:* It is proposed that there will be free exchange of publications dealing with seed technology between F.A.O. and I.S.T.A. as well as member countries of I.S.T.A. and F.A.O. It is proposed that the Secretary of I.S.T.A. be the liaison member for the project."

The 1953 meeting authorized seed technicians in FAO to be members of appropriate committees.

Despite the scope of interests and activities that this cooperative relationship with FAO reveals, a review of ISTA committee functions and proceedings shows that through the years the association has emphasized two objects as basic: the development of uniform methods of testing seed and of expressing quality of seed.

Steps toward their realization were taken at Rome in 1928 when international rules for seed testing were first considered and at Wageningen, the Netherlands, in 1931 when the rules were first adopted.

The significance of such rules to the countries of Europe is apparent when we consider the problems of buying and selling seed in Europe without the rules. They would be quite similar to problems here in the United States if each of our States had its own methods of testing and expressing seed quality.

The methods are uniform throughout the United States, however, thanks to the Association of Official Seed Analysts of the United States and Canada, formed in 1908.

The forms used by the State seed laboratories in reporting the results of seed tests vary in format. But, since the early days of seed testing in the United States, they all have conveyed the same information expressed in the same manner following tests made in accordance with the same basic procedure. The results of these tests vary on occasion, but variations are kept to a minimum that is noteworthy in light of the difficulties involved. Closer uniformity in results of tests made in seed testing laboratories throughout the United States is a continuing problem involving personnel, equipment, availability of technical training, and the nature of living things.

Considering the experience in the United States, it is not surprising that the development of international rules of seed testing was accompanied by the development of the so-called "international certificate" (seed laboratory report) to be used by the member countries in commerce between the countries. The primary need for the certificate was in Europe.

ISTA prints the forms and sells them to the member countries. They are available in two colors: Orange, for samples drawn by an official inspector from containers that he seals; and blue, for samples submitted to a laboratory by someone other than an official inspector.

When the international rules for seed testing were drafted, they permitted the use of either the European or the United States-Canadian methods of testing seed—a permission that complicated trade between the European and North American Continents. For the basic concept of seed testing developed in most European laboratories was quite different from that held by laboratories in the United States and Canada. Here, laboratories followed the "quicker method" (QM) and, in Europe, the "stronger method" (SM). Seed merchants attempting to trade between the two continents found themselves unable to obtain laboratory tests on one continent that would agree with those on the other.

At the seed herbarium of a Federal seed testing laboratory in the United States, a technologist compares an unidentified seed with samples of known identity. Identification from seed characteristics is but one of the many procedures being developed under the auspices of ISTA.

This was the situation that faced the few remaining leaders of ISTA when, after World War II, the revival of the association was considered. At the first postwar meeting, held in Washington in 1950, an effort was made to avoid referring to QM and SM. Detailed rules for seed testing were considered and in 1953 were finally adopted, to become effective in the Southern Hemisphere on January 1, 1954, and in the Northern Hemisphere on July 1, 1954. These new international rules lean heavily in the direction of methods used on this side of the Atlantic.

A next step concerned the application of the new rules in the daily routine of the seed testing laboratories. The rules apply to the single item "seed," but the number of kinds of seed in commerce runs into the hundreds, and the problems with the different kinds are not alike. It is a complicated business.

Therefore, in July 1954 at Cambridge, England, a course of instruction was conducted under the auspices of the Organization for European Economic Cooperation; representatives from 19 countries attended. Because each had already encountered some problems, the need for modification and more precise wording of the rules was a principal subject of discussion. No revisions could be made at that gathering of course, and the need will probably continue to be a source of discussion, at least until the association meets in 1956.

While ISTA was developing its international rules, it was making progress also along other lines.

The association has been encouraging uniformity in plant nomenclature.

Techniques were being worked out for the detection of a number of seedborne disease organisms; and in 1953 a committee was authorized to prepare a handbook on the subject. Too, the association has been cooperating with the European Plant Protection Organization for the purpose of encouraging the testing of seed in international commerce and the issuing of certificates of "sanitation."

The testing of tree seeds is of high interest to several of the member laboratories. In fact, some European laboratories considered adopting uniform methods and rules for testing them; and ISTA, at its 1953 meeting, included the testing of tree seeds in its functions.

The sampling and testing of seed in nonuniform lots and research to determine the agricultural value of hard seed in legumes, the effect of moisture content and temperature on the longevity of seed, and the possibilities of varietal identification from seed and seedling characteristics—all have been discussed from the standpoint of their application to ISTA's principal objectives—the development of uniform methods of testing seed and of expressing quality of seed.

Agricultural Production in Asia And the Middle East

By DWIGHT R. BISHOP

The more we survey facts and figures about food production and consumption in Asia and the Middle East, the closer we come to the conclusion that the food deficits in those great areas are likely to continue, and to continue in ever-increasing size.

True, in both Asia and the Middle East the overall agricultural production in the three latest crop years is considerably higher than the prewar average. Even though 1954-55 has suffered some decline from the year before, it is still doing better than the prewar years—14 percent better in Asia and 39 percent better in the Middle East.

Considered in isolation, these gains would seem hopeful signs. But the principal offsetting factor—the population rise—is so strong that for Asia as a whole the production per capita has actually fallen to 90 percent of the prewar average, and for the Middle East, where production has increased more, it has barely managed to stay about the same.

Together, Asia (excluding areas in the USSR) and the Middle East have 55 percent of the world's people—1.45 billion, including an estimated 580 million in mainland China. If we assume, conservatively enough, that the population there is increasing at the rate of 1.5 percent a year, the increase in the next 10 years will approximate 230 million people. To feed that many people more at the current rate of consumption—1,900 to 2,400 calories per person per day in 1953-54—would require about 40 million additional short tons of food grain, or about 80 million more acres of land in food grain at the currently prevailing yields.

But the food-production history in the two areas does not indicate that they will be able to produce enough food for that many people. Since 1939 both Asia and the Middle East have changed from net

Methodology

The indexes of agricultural production presented here for Asia and the Middle East are based on the prewar value of agricultural commodities produced in those regions.

First, a weight for each commodity was calculated by expressing the prewar value of a quantity of that commodity as a percent of the prewar value of an equal quantity of the most important crop in each region—milled rice in Asia, wheat in the Middle East. Next, the production of each commodity for each year in each country was multipled by the weight established for that commodity.

The aggregates thus obtained for all the commodities produced in each country were added together. Then, the total aggregate values for each postwar year were divided by the prewar average aggregate to obtain index numbers that show percentage changes in total agricultural production for the individual countries. A further calculation was made to adjust each country's production index to its population increase.

Mr. Bishop is Regional Specialist, Asia and Middle East Analysis Branch, FAS.

exporters of food grains to net importers; in 1954-55 they imported some 4.8 million tons. Even under the assumption that production of food grains will increase by 25 million tons in the next 10 years, the deficit would still be in the neighborhood of 20 million tons.

In the following presentation, indexes of agricultural production for most countries of Asia and the Middle East—chief exception, mainland China—have been set forth for the three latest crop years, 1952-53 to 1954-55; they are based on the prewar average, 1935-39. They show the general trend in agricultural production in those countries and, when related to population growth, reveal to what extent agricultural production has kept pace with the population.

For many crops, it is interesting to note, the production in Asia and the Middle East makes up a substantial share of the world total. For instance, at least 90 percent of the rice comes from these areas, as does all but a fraction of such tropical crops as tea, pepper, jute, copra, abacá, and rubber.

Contribution of Asian and Middle Eastern countries[1] to total world production of specified crops, 1953

Commodity	*Unit*	*Production*	
		Total	*Asia and Middle East*
			Percent of total
Rice (rough)[2]	Million lbs.	268,791	90
Wheat	1,000 bu.	7,260,000	25
Barley	.... do	2,815,000	31
Grain sorghums and millets[3]	1,000 s. tons	56,416	75
Sweetpotatoes and yams[3]	.... do	68,850	67
Dry beans and peas[3]	.... do	24,683	70
Tea[2, 3]	1,000 lbs.	1,274,309	96
Sugar	1,000 s. tons	46,552	21
Pepper	Million lbs.	67	99
Cotton	1,000 bales	37.910	29
Jute	1,000 lbs.	2,531,662	97
Abacá	.... do	282,000	89
Peanuts	1,000 s. tons	12,010	63
Soybeans	1,000 bu.	645,120	57
Copra	1,000 s. tons	3,194	83
Tobacco[4]	1,000 lbs.	7,465,560	40
Rubber	1,000 l. tons	1,725	93

[1] In addition to the countries treated in this article, includes mainland China and Manchuria.

[2] Does not include mainland China and Manchuria.

[3] Five-year average, 1948-52.

[4] Does not include Manchuria.

Asia

In Asia, particularly, overall agricultural production, despite increases, has not kept pace with population growth.

India. In 1953-54 India's total agricultural production, 7 million tons more than in the preceding year, reached a record high. This accomplishment was due partly to recent efforts by the Government to increase production through greater acreages and better methods, but partly to exceptionally favorable weather. Even with this record harvest, however, per capita production was still less than the prewar average, and purchases abroad—about 1 million tons of rice and ¾ million tons of wheat—were necessary to supplement the domestic supply for feeding the rapidly growing population. In 1954-55 the country's output suffered a major decline.

Of the industrial crops, jute has shown the greatest increase; in 1952-53 it reached 235 percent of the prewar figure. Increases have occurred also in cotton, tea, and vegetable oilseeds.

Pakistan. In Pakistan, both total and per capita agricultural production have been somewhat lower than in India. The reasons: an influx of several million refugees from India and a shortage of water for irrigation.

Production of food crops—principally rice in East Pakistan and wheat in West Pakistan—has risen to about 125 percent of the prewar level. But this increase has been accomplished only through a reduction in industrial crops: the Government, in its campaign to grow more food, has imposed acreage controls on industrial crops. As a result, production of jute, principal cash crop in the east, has declined to about one-half of the prewar figure; and production of cotton, principal cash crop in the west, has declined to about two-thirds.

Ceylon. Ceylon is one of the two Asiatic countries in which production has outstripped population growth; in this respect 1954-55 was the best year of all.

Influenced by high prices, Ceylon's rubber production in 1954-55 has advanced to 172 percent of the 1935-39 average, and tea production to 152 percent. Copra output, too, has increased significantly. Rice production has reached 157 percent, an increase especially important to Ceylon, which must import most of its food.

(Continued on page 101)

Problems of Isr

By L. E. SAMUEL

The new nation of Israel, chronically short of foreign exchange, is struggling vigorously toward greater self-sufficiency. At the same time, it is encouraging its farmers to produce what export crops they can, knowing that any increase in its exports would give it added leeway to import more of the other agricultural products.

Some of Israel's farm problems come from its earlier efforts to increase production by expanding to large uncultivated areas its unique system of intensive farming in various types of settlements. In this article an official of the Israeli Ministry of Agriculture describes some of these problems.

Agricultural Policy in Former Palestine

Before 1949, intensive diversified farming (mostly organized by Jewish colonization agencies) and extensive Arab agriculture existed side by side in Palestine. The output of diversified farming went mainly to the local market, and the overall quantity of food produced had to be supplemented by considerable imports, the bulk of which went to the Jewish community.

Unlike the other branches of farming, citriculture had a uniform character regardless of ownership. It was then, as it is today, the area's main export industry; only a small part of the total production, mainly fruit not suitable for export, was sold locally.

As a result of the severe shortage of land for Jewish colonization in Palestine, farms were established on very small areas. If irrigation was possible, even at considerable expense, an allotment of 5 to 7.5 acres was considered sufficient. If the area was only partly irrigated, the allotment was twice, and sometimes three times, as large. Entirely unirrigated farms were given 20 to 40 acres and more, according to the quality of the soil and the quantity and distribution of the rainfall.

But no matter what the size of the farm, only by keeping pedigreed livestock and by carefully observing crop rotation could the farmer secure even a modest income. On the smallest type of farm, farmers derived about 40 percent of their income from dairy farming, 20 to 25 percent from poultry farming, and the remainder from growing vegetables and noncitrus fruits; there was no room for grain. On the farms established in unirrigated areas, fruit growing had a larger share; dairy and poultry farming together grossed about one-third of the total income; and grain production attained a substantial size. Vegetables were grown for domestic consumption only. For livestock production, the smallest farms—the type predominant at that time—had to buy all their feedstuffs except green fodder. Large supplies of fodder cereals were obtained from Arab farms in Palestine and throughout the Middle East.

Jewish intensive farming provided Jewish urban markets with fluid milk, cream, sour milk, cottage cheese, eggs, poultry, carp (from farm ponds), vegetables, and fruit, on a scale steadily increasing up to 1945-46. Almost all other food had to be imported or else bought from local Arab farmers.

Israel's most famous farmer, David Ben Gurion (formerly Pri
agricultural production in bleak a

Agriculture

Bread-grain production was far below requirements; sugar was not produced at all; neither were oilseeds (for the manufacture of margarine and cooking oils). Local milk production was too low for the manufacture of cheese or butter, except for small quantities. Fish (except carp from ponds) were all imported. Beef was only a byproduct of milk production. In sum, locally produced food covered at best about 50 percent of the demand in terms of value, and much less when calculated in calories.

Agricultural Policy in Israel

Since 1949, when Israel became independent, its agriculture has gradually expanded, largely along the lines of earlier intensive diversified farming. Extensive farming continues where Arab farmers have remained on their farms; but the majority of them had left by 1949. In that year roughly 650,000 acres of farmland was uncultivated, as was most of the pasture land—some 500,000 to 600,000 acres. Jewish farm settlements were completely cut off from the feed supplies formerly furnished by Arab farming. Hence it was imperative that a large part of the then empty land be used to produce feedstuffs of all kinds. Part of the land reserve was gradually distributed among more than 300 new settlements established for new immigrants; part was given on long-term and short-term leases to settlements established earlier, thus rounding off their holdings. Among these settlements, those that are affiliated to Histadruth—Israel's labor organization, with a membership of 33 percent of the population—are of three types: collective settlements (kwuzot), smallholder settlements, and a mixed form. In the first and last types, members operate one farm unit together.

elps cut straw on his farm in the Negev region. Increasing one of Israel's main problems.

By 1954, almost all the land suitable for intensive farm methods—nearly a million acres—was under cultivation, and improvement of the pasture land had begun. Operations on a larger scale will take time; additional production will depend largely on irrigation.

Citriculture has retained its earlier character, but the citrus area is smaller than during the mandate period. Citrus farmers suffered a serious setback from the closing of the Mediterranean Sea to shipping during World War II; and at the end of the fighting of 1948-49, it became obvious that it would take time to restore to earlier production levels the groves formerly in Arab possession.

Since 1948-49 Israel's mixed farming has expanded threefold; food production alone (i.e., the total after deduction of feedstuffs, tobacco, and some fibers) has increased by over 100 percent. Nevertheless, for reasons that will follow, import requirements have remained substantial.

On a per capita basis, and with due regard to the growth of the nonagricultural population, the output of food has increased only by about 20 percent—not enough to change the basic dependence on imports. Furthermore, intensive farming has largely retained its earlier structure, in which dairy

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Dr. Samuel is Economic Adviser, Ministry of Agriculture, Israel.

Problems of Isras Agriculture

By L. E. SAMUEL

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Unlike the other branches of farming, citriculture had a uniform character regardless of ownership. It was then, as it is today, the area's main export industry; only a small part of the total production, mainly fruit not suitable for export, was sold locally.

As a result of the severe shortage of land for Jewish colonization in Palestine, farms were established on very small areas. If irrigation was possible, even at considerable expense, an allotment of 5 to 7.5 acres was considered sufficient. If the area was only partly irrigated, the allotment was twice, and sometimes three times, as large. Entirely unirrigated farms were given 20 to 40 acres and more, according to the quality of the soil and the quantity and distribution of the rainfall.

But no matter what the size of the farm, only by keeping pedigreed livestock and by carefully observing crop rotation could the farmer secure even a modest income. On the smallest type of farm, farmers derived about 40 percent of their income from dairy farming, 20 to 25 percent from poultry farming, and the remainder from growing vegetables and noncitrus fruits; there was no room for grain. On the farms established in unirrigated areas, fruit growing had a larger share; dairy and poultry farming together grossed about one-third of the total income; and grain production attained a substantial size. Vegetables were grown for domestic consumption only. For livestock production, the smallest farms—the type predominant at that time—had to buy all their feedstuffs except green fodder. Large supplies of fodder cereals were obtained from Arab farms in Palestine and throughout the Middle East.

Jewish intensive farming provided Jewish urban markets with fluid milk, cream, sour milk, cottage cheese, eggs, poultry, carp (from farm ponds), vegetables, and fruit, on a scale steadily increasing up to 1945-46. Almost all other food had to be imported or else bought from local Arab farmers.

Israel's most famous farmer, David Ben Gurion (formerly Prime , helps cut straw on his farm in the Negev region. Increasing agricultural production in bleak areas is one of Israel's main problems.

Bread-grain production was far below requirements; sugar was not produced at all; neither were oilseeds (for the manufacture of margarine and cooking oils). Local milk production was too low for the manufacture of cheese or butter, except for small quantities. Fish (except carp from ponds) were all imported. Beef was only a byproduct of milk production. In sum, locally produced food covered at best about 50 percent of the demand in terms of value, and much less when calculated in calories.

Agricultural Policy in Israel

Since 1949, when Israel became independent, its agriculture has gradually expanded, largely along the lines of earlier intensive diversified farming. Extensive farming continues where Arab farmers have remained on their farms; but the majority of them had left by 1949. In that year roughly 650,000 acres of farmland was uncultivated, as was most of the pasture land—some 500,000 to 600,000 acres. Jewish farm settlements were completely cut off from the feed supplies formerly furnished by Arab farming. Hence it was imperative that a large part of the then empty land be used to produce feedstuffs of all kinds. Part of the land reserve was gradually distributed among more than 300 new settlements established for new immigrants; part was given on long-term and short-term leases to settlements established earlier, thus rounding off their holdings. Among these settlements, those that are affiliated to Histadruth—Israel's labor organization, with a membership of 33 percent of the population—are of three types: collective settlements (kwuzot), smallholder settlements, and a mixed form. In the first and last types, members operate one farm unit together.

By 1954, almost all the land suitable for intensive farm methods—nearly a million acres—was under cultivation, and improvement of the pasture land had begun. Operations on a larger scale will take time; additional production will depend largely on irrigation.

Citriculture has retained its earlier character, but the citrus area is smaller than during the mandate period. Citrus farmers suffered a serious setback from the closing of the Mediterranean Sea to shipping during World War II; and at the end of the fighting of 1948-49, it became obvious that it would take time to restore to earlier production levels the groves formerly in Arab possession.

Since 1948-49 Israel's mixed farming has expanded threefold; food production alone (i.e., the total after deduction of feedstuffs, tobacco, and some fibers) has increased by over 100 percent. Nevertheless, for reasons that will follow, import requirements have remained substantial.

On a per capita basis, and with due regard to the growth of the nonagricultural population, the output of food has increased only by about 20 percent—not enough to change the basic dependence on imports. Furthermore, intensive farming has largely retained its earlier structure, in which dairy

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and poultry farming and vegetable and fruit production dominate. Important as has been the increase of farm-grown fodder resources from less than 30 percent of requirements to over 70 percent, this in itself does not reduce imports of food for direct human consumption. Not until 1954 did the production of oilseeds—one of the three most essential food crops—attain an appreciable level; peanuts, for example, have now become a commercial crop. Bread grains and sugar are the other two most essential food crops. But production of wheat has remained low, and production of sugar has not yet begun, although sugar beets have been planted on more than a thousand acres. One achievement of 1954 was that potatoes were produced in ample supply throughout the year. Meat production has been facilitated, and preparations have been made for establishing a deep-sea fishery. But all these additions to the food supply are just a beginning. Moreover, only during the current year (1955) will milk be produced on a scale sufficient to cover the demand for fresh use; and substantial imports of milk powder will still continue, for making certain kinds of cheese.

Faced by a chronic shortage of foreign currency, Israel is aiming at a high degree of self-sufficiency in food, with a diet adjusted to its special needs. However, any substantial increase in agricultural (or other) exports would reduce the necessity for drastic limitations on imports of food. A considerable increase in exports of citrus fruit should prove possible. The exportation of 12 million cases seems a reasonable target for the years 1962-64; in 1938-39, exports from former Palestine attained a peak of 15 million cases, and in 1953-54 exports from Israel alone reached 8 million. Only a start has been made in exporting vegetables, peanuts, bananas, and table grapes. Chances in this field are promising, but success will depend on most careful preparation. Seasonal advantages must be skillfully used. Only products of high quality can be sold at a profit in a competitive world market.

In line with the goal of increased self-sufficiency, a gradual shift in the main trend of Israel's agriculture is clearly discernible, from livestock production to field crops and to the utilization of pasture land. This shift is one of the ends of Israel's agricultural policy; in attempting it, Israel has received technical assistance on a generous scale, both from the Food and Agricultural Organization of the United Nations and from the United States Operation Mission (USOM) administering the United States technical assistance program in Israel. This international assistance has already had important results, and will become more and more effective as time passes.

Self-Sufficiency Program

Israel's basic agricultural policy involves colonization on the land. An increase in agricultural production, to the optimum degree of self-sufficiency, is the foremost goal of colonization, but not its only one. There are also certain social and political goals to be gained, and in considering the problems of self-sufficiency these other goals have been taken into account.

Target

The goal of self-sufficiency is gradually being changed from a maximum, limited only technically and by land and water resources, to an economic optimum, dictated by local costs of production and the purchasing power of consumers. Although it would be technically feasible for domestic production to furnish as much as 85 percent of total food supplies, the economically practicable goal may be estimated at 65 to 70 percent. In any case, local farmers should fully meet the requirements of fluid milk and related products such as cream and sour milk; eggs in shells; and vegetables and fruits. Local production should further cover in substantial part the requirements of fish, mutton, and oilseeds for producing vegetable fats. Production of wheat and beef may reach only a third of requirements. As for sugar, the share of local production in total supply will be determined by price and desired per capita consumption. The official target is 100 percent, but economic realities may modify this.

Problems

High farm costs. Prevailing prices of locally produced foodstuffs may be estimated on an average at 15 to 20 percent above import prices, if the official rate of exchange (£ 1.80 per dollar) is used. Obviously these differences ought to be much smaller when locally produced food constitutes some 70 percent instead of 50 percent of the diet. And if exports are to be developed, prices must be low enough to meet competition abroad. There is a real chance that reduced costs and prices will result from higher yields per dunam or per head of livestock and from fewer working days per unit produced on the farm, as farm efficiency increases in the following ways:

(1) New settlers will become more experienced. One-third of Israel's milk, over 45 percent of its vegetables, and perhaps one-fifth of its eggs are now produced on settlements established since 1949, so that costs for large quantities of food are involved.

(2) New settlements will gradually obtain full equipment. These settlements, on the average, have scarcely more than 60 percent of the equipment they need, and this lack naturally increases their costs.

(3) New farm areas, not yet definitely integrated into intensive farming, will become essential parts of fully developed farm units. Because the farmland added to other settlements has not all been integrated into full farm operation, it is still under extensive cultivation, with lower yields per acre. Manure is insufficient because the livestock population has not increased in proportion to the increase in area. Still lower is the productivity of land leased out to settlers in districts separated from their main fields, where labor teams are maintained for certain seasons only and no livestock at all is being kept. Notably in the Negev, such areas produce fodder cereals and ship them after harvest as far as 130 miles.

A small pumping station draws water from the Jordan to irrigate fields near Dagania in Israel. Like other Middle Eastern countries, Israel finds its agriculture cramped by lack of water.

(4) Experience in new kinds of farming will increase. Israel's farmers still have very limited experience in some branches of farming, especially in the production of crops like cotton and sugar beets, and also in the production of cereals under irrigation during both summer and winter. Wheat, a winter crop, might be made more profitable through auxiliary irrigation.

Shortages in means of production. An additional problem is the shortage in means of production like feedstuffs, fertilizers and insecticides, farm machinery, fuel, and water. In these respects, rigid targets cannot be set up because the range of issues involved is too large.

(1) Feed. There is substantial ground for the assumption that all feedstuffs should be produced in the country except for animal protein meals. Strong efforts are being made to increase feed production on the newer farmland.

(2) Fertilizer. Preparations for local production of such fertilizers as are still being imported are well advanced. A large nitrogen factory was opened recently. In addition, Israel possesses phosphate deposits that are being mined.

(3) Farm machinery. Certain kinds of farm machinery are already being manufactured in Israel.

(4) Fuel. Fuel for the farm is not available in Israel unless oil can be found or hydroelectric power generated. However, local and foreign enterprises are now boring for oil; and, upon an understanding with Israel's neighbors, the Lowdermilk-Cotton-Hays irrigation scheme under the Jordan Valley Authority could be carried into effect. This scheme would provide the whole area with vast quantities of electric power.

(5) Water. The Lowdermilk-Cotton-Hays scheme would irrigate a great part of Israel's agricultural land. But the existing irrigation plan is designed to develop within 6 to 8 years water resources sufficient for the irrigation of almost half the culti-

vable area, apart from pasture land. The time needed for the realization of this vast project is, of necessity, a rough estimate. The increase in irrigated area was, however, pronounced during the last 2 years, and will certainly continue to be substantial during the next 3 or 4.

Financial support. Financial means for the development of agriculture to its optimum size should be found through Government sources and through long-term loans, the latter largely from foreign sources. There are strong arguments in favor of negotiating the loans needed for expansion of food and fiber production. In any case, the problem of financing is a major one. It is not known how much time is needed for carrying out development plans, notably as far as irrigation is a precondition.

Labor supply. Perhaps the most immediate problem facing Israel's agriculture is the shortage of farm labor. The official target is to double the present number of farm units within 6 to 8 years, from roughly 45,000 units to 90,000, or to obtain a farm population of 350,000 to 400,000 within a total population of 2,000,000. For such an increase in farm population, many of the new immigrants would have to settle on the land; many young people from urban surroundings would have to become farmers; and finally, certain groups of urban workers would have to be shifted from cities to rural settlements.

Measures to provide manpower for agriculture may be summarized as follows:

(1) Education. Agricultural education would have to be provided for the three groups of would-be farmers, in forms adjusted to their special needs. New immigrants under 18 could join urban youth in agricultural secondary schools. Urban youth itself should be made familiar with farm work as early as elementary school. This part of the program is already under way; these boys and girls go to agricultural schools at the age of 14 or 15, and after graduation some of them go to the Agricultural Faculty of the Hebrew University. For urban workers the change in trade would require arrangements for adult training courses on a wide scale.

All these methods have been explored, and facilities for study are being steadily improved. But the extent of agricultural training is still very restricted. To expand the network of agricultural schools and other training centers, many additional teachers are needed. This shortage is being recognized and training made available to an increasing number of candidates.

It will, however, be some years before enough facilities can be provided to make possible the doubling of the farm population.

(2) Social and cultural incentives. In the cultural life of the nation much is already being done toward extensive participation by farm people. Theater performances and concerts are being given in larger settlements, accessible to members of neighboring settlements within a reasonable distance. Youth clubs will soon be established, with the assistance of USOM. Films are shown regularly in many settlements, and lectures are arranged on many subjects in addition to technical agricultural topics. Socially, farmers enjoy a high reputation in Israel, and their organizations wield much influence in the government, the national economy, and many other fields.

(3) Financial incentives. There would remain the problems of financing the establishment of farms, insuring a standard of living comparable with urban standards, and protecting the farmer's livelihood. Israel is making a strong effort to solve these problems. Would-be farmers, if suitable candidates, may settle on the land with very scanty means of their own or none at all. In collective settlements, no financial contributions whatsoever are requested by the colonization agencies; in smallholder settlements, contributions are very low and may be waived in special cases. Land, water installation, livestock, and farm equipment are provided, enough to start farm operations that will yield more than half of the usual farm income. For the remainder, outside work is available, or the farmer can finance the building up of his farm by long-term loans. To do still more for the farmer would be neither financially possible nor psychologically sound. For a number of products, prices are guaranteed. Cooperatives relieve the farmer from any effort in marketing; through cooperatives also, he can purchase feedstuffs, fertilizers, and any other items. By means of all these incentives, a pronounced effort is being made to settle people on the land. In view of the predominantly urban background and character of the Jewish people throughout many centuries, this effort is indispensable. If it lasts and is steadily pursued, a gradual increase in the agricultural sector of Israel's population seems predictable.

Cacao Pods as a Substitute for Corn in Tropical Dairy Rations

By C. E. HAINES and A. J. ECHEVERRIA

Both Mr. Haines and Mr. Echeverria, at the time of the tests here described, were research assistants in the Livestock Research Department of the United Fruit Co., La Lima, Honduras. Mr. Haines is now Graduate Assistant, Department of Animal Husbandry and Nutrition, University of Florida, Gainesville; and Mr. Echeverria is associated with the Ministry of Agriculture, Honduras.

Latin American dairymen have long been searching for a low-priced palatable ingredient that they can substitute for corn in dairy rations. Corn, of course, is scarce in the Tropics of Latin America and, besides, is basic there in the diet of human beings. As a result it is usually a highly expensive feedstuff.

One of the recent and promising possibilities to come to the attention of these farmers is a meal made from fresh cacao pods from which the pulp and the beans have been removed. In Almirante, Panama, where the meal got early tests in dairy rations, it was made by putting the pods into Gordon dryers, keeping them there 42 hours at 180° F. to get the moisture down to approximately 4 percent, and then pulverizing them in a hammer mill into a product that had about the consistency of coarse corn meal.

Among the advantages of the pod meal is that it would be in plentiful supply in the Tropics wherever cacao is widely grown. The cacao processing plant in Almirante is said to have a potential output of 8 million to 10 million pounds of meal a year, an estimate based on the current production of dried cacao beans (used for making chocolate, cocoa, and cocoa butter): for every pound of dried beans, 2 pounds of pod meal can be had. It is fur-

Average milk production and feeding efficiency of cows when fed a test ration containing cacao pod meal and when fed a control ration without cacao pod meal, both rations being fed at the rate of 4 and 6 pounds a day, El Rancho Dairy, Honduras

Test period	*Cacao-pod-meal ration*[1]			*Control ration*[2]		
	Animal group No.[3]	*Average milk production*[4]	*Feed eaten per 100 lbs. of milk produced*	*Animal group No.*[3]	*Average milk production*[4]	*Feed eaten per 100 lbs. of milk produced*
		Pounds per week	*Pounds*		*Pounds per week*	*Pounds*
4 lbs. of ration per day:						
First period (8 wks.)	1	86.68	24.68	2	95.23	27.10
Second period (4 wks.)	2	63.70	38.58	1	61.76	38.01
Third period (4 wks.)	3	48.66	54.84	3	65.72	40.44
Average	—	66.35	32.92	—	74.24	32.03
6 lbs. of ration per day:						
First period (8 wks.)	3	95.07	36.68	4	100.31	38.39
Second period (4 wks.)	4	59.56	59.80	3	75.15	49.71
Third period (4 wks.)	2	56.32	68.53	1	54.28	63.86
Average	—	70.32	47.04	—	76.58	45.16

[1] The cacao-pod-meal, or test, ration consisted of cacao pod meal (28.70% during the first 7 weeks of the experiment, and 35.23% during the rest of it), chopped ears of corn (including husks), wheat bran, rice bran, palm kernel meal, copra meal, and mineralized salt. Crude protein content was 12.63% for the 4-pound rate and 12.66% for the 6-pound rate.

[2] The control ration contained the same ingredients as the test ration except for the cacao pod meal. Crude protein content was 12.60% for the 4-pound rate and 12.63% for the 6-pound rate.

[3] Each of the 4 groups contained 5 cows. Animals were between 3 and 7 years old and had been in lactation from 59 to 99 days when the test began.

[4] In terms of 4-percent fat corrected milk.

ther estimated that the plant could produce 1 to 2 tons of meal a day—at the low overall cost of only 1¼ cents a pound.

Cacao pod meal is not the first feed to be made from parts of the cacao fruit. Cacao meal, made from the bean after most of the fat has been pressed out, and ground cacao shells, made from the hard coating of the bean, have already been rather widely tested for cattle, swine, and poultry. But both these products contain fairly large percentages of theobromine, which is cumulatively toxic to animals; cacao meal has 1½ to 3 percent of this alkaloid; ground cacao shells, 0.70 to 1.20 percent. Pod meal, on the other hand, has shown itself to have the substance in only minute amounts.

According to an analysis of a composite sample of the pod meal, its makeup is as follows: Moisture, 12.60 percent; ash, 7.58 percent; protein, 8.11 percent; crude fiber, 34.82 percent; fat, 3.29 percent; and nitrogen-free extract, 33.59 percent.

If reasonable care is taken, the meal does not mildew or sour in storage. Of course it has to be kept in a dry place and otherwise be handled in the same way as corn and other grains.

Just how satisfactory this meal is as a feed has been explored in a number of places.

In Almirante, at the United Fruit Co.'s dairy, the conclusion was reached that a ration containing 28 percent of the meal is entirely satisfactory in rations. But this conclusion was based only on individual observations, not on experimental findings.

At the Inter-American Institute of Agricultural Sciences at Turrialba, Costa Rica, a small group of dairy cows and pigs were used in a test to evaluate a cacao pod meal ration in its effect on both milk production and fattening. Results obtained there indicate that the meal is entirely satisfactory as a substitute for corn for both purposes; but the Institute suggested additional investigation with larger groups of animals. (Later studies have been made by the Institute, in 1954, but data were not at hand at this writing.)

In Honduras we ourselves worked on a feeding experiment carried out by the Tela Railroad Co. in 1952 under the direction of Henry G. Hogaboom, Livestock Supervisor of Tropical Banana Divisions of the United Fruit Company.

This experiment involved tests with two separate dairy herds—at El Rancho and Puerto Arturo. From the former, 20 cows were selected (4 groups of 5 each); from the latter, 28 (2 groups of 14 each). Every effort was made to equalize the test and control groups within each herd; one of the selection factors consisted of the recorded milk production for a 2-week pretest period. All the cows selected were average producers and were considered typical of good native cows.

Test and control rations were fed at both dairy ranches. In the test rations, cacao pod meal replaced corn that was present in the control, or usual, rations (further details are given in the two tables). Definite amounts of the rations were fed

Average milk production and feeding efficiency of cows when fed a test ration containing cacao pod meal, and when fed a control ration without cacao pod meal, both rations being fed at the rate of 6 pounds a day, Puerto Arturo Dairy, Honduras

Test period	*Cacao-pod-meal ration*[1]			*Control ration*[2]		
	Animal group No.[3]	*Average milk production*[4]	*Feed eaten per 100 lbs. of milk produced*	*Animal group No.*[3]	*Average milk production*[4]	*Feed eaten per 100 lbs. of milk produced*
		Pounds per week	*Pounds*		*Pounds per week*	*Pounds*
First period (4 wks.)	1	117.24	34.72	2	118.50	32.30
Second period (4 wks.)	2	97.78	41.74	1	91.45	41.70
Average	—	107.51	37.80	—	104.97	36.55

[1] The cacao-pod-meal, or test, ration consisted of cacao pod meal (35.90%), copra meal, wheat bran, and mineralized salt. Crude protein content was 14.60%.

[2] The control ration contained the same ingredients as the test ration except that chopped ears of corn (including husks) took the place (35.90%) of the cacao pod meal. Crude protein content was 14.56%.

[3] Each of the two groups contained 14 cows. Animals were between 3 and 14 years old, and had been in lactation from 26 to 89 days when the test began.

[4] In terms of 4-percent fat corrected milk.

twice daily, regardless of the cows' production, and weigh-back material was recorded. All animals were on pasture when not in the milking barn.

Over-all results indicate that the cows ate slightly less feed and produced slightly less milk on the cacao pod meal ration than on the control ration. The investigators therefore have concluded that the pod meal is not quite so palatable as the chopped corn ears. Taste tests showed also that the meal did not affect the odor or the flavor of the milk to any noticeable extent.

At El Rancho the efficiency of the pod meal ration, in comparison with that of the control ration, was 97.30 percent at the 4-pound feeding rate and 96.01 percent at the 6-pound rate. At Puerto Arturo it was 96.69 percent.

In other words, 96 to 97 pounds of chopped ears of corn (including husks) have the same feeding value as 100 pounds of cacao pod meal—at least in the proportions used in the tests here described. These data suggest that a farmer's decision to use the pod meal in dairy rations would depend on a cost-per-pound comparison of the two feedstuffs, and that whenever and wherever a pound of cacao pod meal costs less than 96 percent of the price of a pound of chopped corn ears, the meal would be the more economical feed to use.

New Releases On World Agriculture

In *Crop Protection,* by C. J. Rose, published this year for the first time (Leonard Hill, Ltd., 9 Eden St., N. W. 1, London, 223 pp., at a price of 30 shillings, or $4.20), the practical agriculturist can learn what chemicals and chemical-applying equipment are available to help him protect his crops from weeds, insects, diseases, and rodents. The author is an entomologist associated with a firm that manufactures spray equipment.

The book is well organized and well indexed, and the reader should have no trouble in finding the specific information he wants. Its value is further enhanced by more than 100 illustrations, several in color. Besides, it has a summary table, arranged by crops, that concisely presents all the successful chemical treatments mentioned in the text, and an appendix that gives much useful information—how to convert one kind of unit of measurement into another, how much diluent to use in 100 gallons of water to make different concentrations, and so forth.

Agricultural Production in Asia and the Middle East

(Continued from page 93)

Burma. In early postwar years insurgent activities in Burma limited farm output, especially output of rice. In recent years, however, conditions have improved substantially. Agricultural production has now increased to match the prewar level, but it is still lagging behind population growth. Even so, Burma has managed to maintain rice exports at substantial, though reduced, levels; in 1954 it exported more rice than any other country.

In addition, Burma has achieved important increases in both rubber and tobacco production.

Thailand. Of all the countries in Asia, Thailand has shown the largest increase in total agricultural production. And it is one of the two countries in which production has increased more than population.

Most of the increase in production can be attributed to the rice crop, which this year has been 189 percent of the prewar average. Most of the rice increment, however, has gone to feed the rapidly growing population, and exports have remained near the prewar level.

Rubber, too, has had a large share in the increased agricultural production. This crop, second only to rice in Thailand, is now more than twice as large as it was before the war. Practically all other crops are at least twice the prewar level; the most important of these are pulses, sugar, oilseeds, and cotton.

Malaya. In Malaya, rubber is by far the most important commodity in the agricultural production index, accounting for about 85 percent of the total weight in recent years; output in 1954-55 has been 144 percent of the prewar average.

Other commodities that are doing better now than they did before the war are rice and palm oil. Because Malaya must import about half of the rice it needs, the Government has been encouraging farmers to expand the size of this crop; the index of production in 1953-54 reached 119.

Indonesia. In the past 3 years Indonesia's total agricultural production has remained steady—at 111 percent of the prewar level. The most important increase has occurred in rubber, which in 1954-55 has reached 198 percent. Other significant increases—in rice, corn, sweetpotatoes, cassava, and soybeans—have more than offset declines in copra, sugar, tobacco, tea, coffee, and the spices.

But, although total production has grown, the population has grown even faster; and per capita production has remained lower than it was before the war.

Republic of the Philippines. In the Philippine Republic, total farm production has stayed well above the prewar average though per capita production has stayed below it. All major crops, except abacá and tobacco, have been produced in larger quantities; most significant increases have occurred in rice, corn, sweetpotatoes, cassava, sugar, and copra.

The Republic is fast approaching self-sufficiency in food crops. The only noteworthy exception is wheat: annual import requirements are about a quarter of a million tons, in the form of flour.

Formosa. Actual production in Formosa in recent years has been nearly as large as it was before the war. With only one exception, all major crops—chiefly rice, sweetpotatoes, cassava, and tobacco—have been produced in significantly greater quantities. But the one exception—sugar—has declined so much (to 66 percent in 1954-55) that it has had a depressing effect on the index of total production.

As a result of extensive migration from the Chinese mainland, per capita production has declined more in Formosa than in any other Asiatic country.

Japan. In Japan total agricultural outturn was substantially higher in 1952-53; but adverse weather reduced yields drastically in 1953-54 and to a less extent in 1954-55.

Rice production has been maintained at about the prewar level, except for the last 2 years, when it has been below that level. Wheat production in 1954-55 is 111 percent of prewar; barley, 146 percent. Sweetpotatoes, white potatoes, oilseeds, fruits, tobacco, and tea also have made significant increases. Such improvements, however, have not been enough to keep up with the population increase; and as a result per capita production is considerably less than the 1935-39 average. Japan still must depend on imports for about 4.5 million tons of grains a year and some 700,000 tons of soybeans.

South Korea. In South Korea, military and insurgent activities have kept total agricultural production low, although the last 2 years have shown considerable improvement.

In 1954-55 rice and other grains have been slightly higher than the prewar level, and sweetpotatoes and white potatoes have been more than three times higher. Nevertheless a sharp reduction in oilseeds and cotton has been enough to make the total production lower than the prewar average. Per capita production has been lower still.

Middle East

In the Middle East total agricultural production for the region as a whole has been significantly above the prewar average; it has increased considerably more than in Asia. More land has been available in the Middle East for acreage expansion, and political conditions have been more stable. Besides, in some countries there has been an increase in the mechanization of farm processes.

Per capita food consumption in specified countries of Asia and the Middle East, crop years 1952-53 and 1953-54, and population on January 1, 1954

Country[1]	*Calories per person per day*		*Population, Jan. 1, 1954*
	1952-53	*1953-54*	
			Millions
Asia:			
India	1,750	1,950	377.3
Pakistan	1,730	1,930	78.7
Burma	2,140	2,170	19.2
Thailand	2,050	2,190	19.6
Indonesia	2,130	2,120	78.7
Philippine Republic	2,280	2,400	21.1
Formosa	2,480	2,340	10.0
South Korea	2,180	2,230	21.8
Japan	2,150	2,100	87.4
Middle East:			
Turkey	2,560	2,670	22.7
Iran	1,890	1,900	20.1
Iraq	2,200	2,270	5.9
Lebanon	2,170	2,260	1.4
Syria	2,090	2,120	3.9
Israel	2,600	2,620	1.7
Jordan	2,100	2,010	1.4
Egypt	2,100	2,190	22.2

[1] For lack of data, Ceylon and Malaya, otherwise treated in this article, are not included.

Turkey. The highest level of production has been attained by Turkey, which has had sizable increases in all important crops. In 1954-55 output has suffered a major decline but is still high compared to what it was before the war.

The production of grains, oilseeds, and nuts has approximately doubled since the war; that of sugar is three times larger; and that of potatoes is up more than 400 percent. Cotton is 243 percent of the prewar average; tobacco, 174 percent. Only in apples, pears, and figs—relatively minor crops—has production failed to increase significantly.

On a per capita basis, practically all crops have shown increases.

Indexes of agricultural production in specified countries of the Middle East, crop years 1952-53 to 1954-55

[1935-39 equals 100]

Country	*Total production*			*Per capita production*[1]		
	1952-53	*1953-54*	*1954-55*	*1952-53*	*1953-54*	*1954-55*
Turkey . .	171	193	164	129	142	118
Iran	111	120	120	91	97	94
Iraq	122	156	148	84	105	97
Lebanon	150	183	170	104	124	112
Syria . . .	148	168	177	97	114	117
Israel . . .	102	120	121	86	99	98
Jordan . .	167	133	173	[2] 100	[2] 79	[2] 101
Egypt . . .	102	100	108	76	72	76
Total .	135	147	139	102	109	101

[1] Indexes of per capita production have been adjusted for population increases.

[2] Based on a population figure that includes nearly one-half million refugees who have been maintained on a minimum subsistence level by United Nations relief agencies.

Indexes of agricultural production in specified countries of Asia, crop years 1952-53 to 1954-55

[1935-39 equals 100]

Country	*Total production*			*Per capita production*[1]		
	1952-53	*1953-54*	*1954-55*	*1952-53*	*1953-54*	*1954-55*
India	110	121	116	90	98	92
Pakistan . . .	100	103	103	86	89	87
Ceylon	143	152	154	102	107	107
Burma	97	92	100	81	76	81
Thailand . .	162	192	184	121	142	135
Malaya	141	136	136	93	89	88
Indonesia . .	111	111	111	95	94	93
Philippine Republic .	127	135	132	94	99	95
Formosa . . .	102	97	96	58	53	52
Japan	114	99	108	92	79	85
South Korea	80	94	95	60	69	69
Total	111	116	114	90	93	90

[1] Indexes of production have been adjusted for population increases.

Iran. In Iran, although total production is now considerably above the prewar level, per capita production is below it.

All principal crops except grapes have increased. In 1954-55 grains averaged 114 percent of the prewar figure; sugar, at 356 percent, has increased more than any other crop. Harvests of cotton, oranges, and nuts also are notably larger.

Egypt. Egypt's total production is now 8 percent over the prewar level, thanks to a moderate increase in 1954-55. The population, however, has increased faster in Egypt than in most other countries of the Middle East, with the result that the index of per capita production is the lowest in the entire area.

Grain crops in 1954-55, principally wheat and corn, are 122 percent of what they were before the war; sugar, 165 percent; potatoes, 400 percent. Cotton, however, has had a major decline, going down to 84 percent. All other important crops are being produced at levels substantially above the prewar.

Other Middle East Countries. For all major crops in Iraq, total production is well above the prewar figure; but in the past year per capita production has fallen below it.

In Lebanon, though the quantity of agricultural production is small, the index of total production stands exceptionally high. Significant increases have occurred in grains, pulses, and fruits. Each of the past 3 years has had a per capita production above the prewar figure.

Syria has seen its harvests of grains, cotton, and tobacco increase considerably; and its index of total production is among the highest in the Middle East.

In Israel, the 1954-55 crops of grains, potatoes, and olives are considerably higher than before the war. But the crop of oranges, by far the most important agricultural commodity, has fallen to 85 percent of prewar and has prevented the year's index of total production from rising to any appreciable extent.

Jordan's high index of total production in 1954-55 owes to increased harvests of grains, fruits, and pulses. However, an influx of about ½ million refugees, together with the usual increase in the country's population, has kept the per capita production index from rising above prewar levels.

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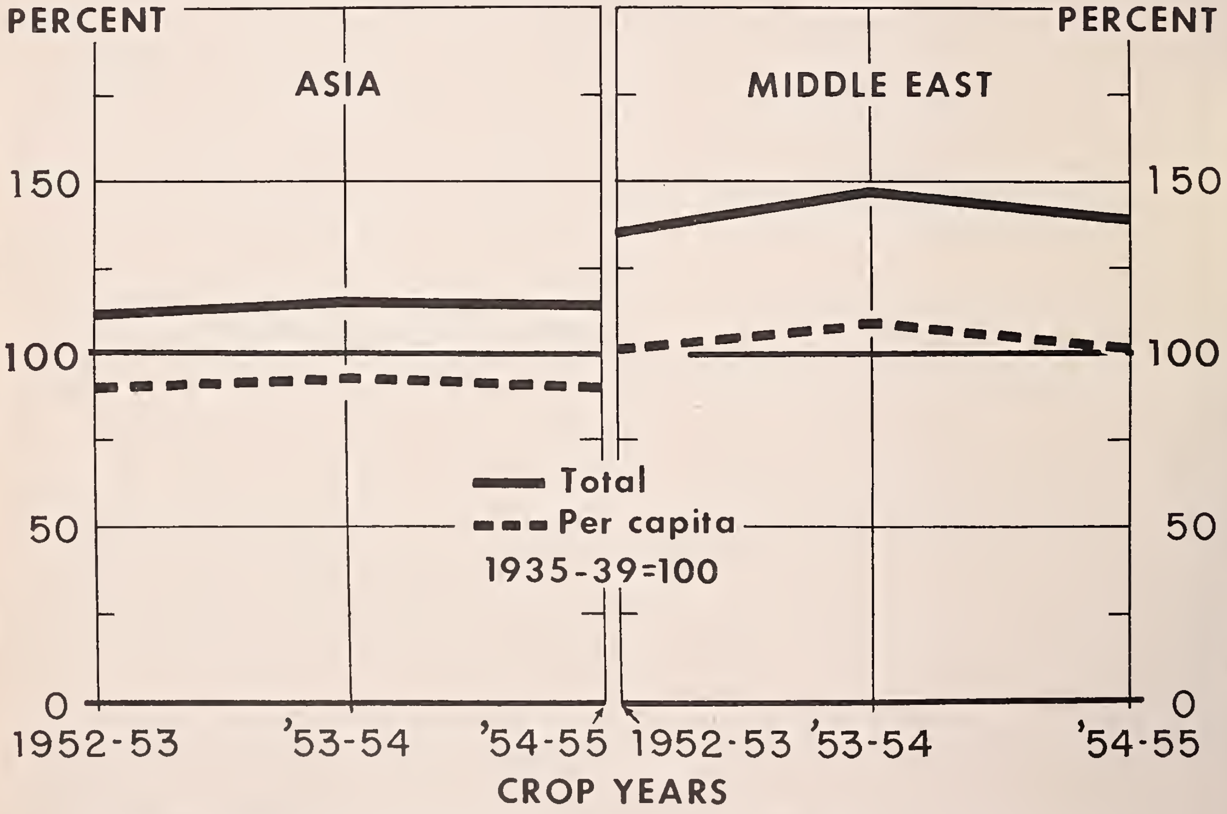
INDEXES OF AGRICULTURAL PRODUCTION * FOR ASIA AND THE MIDDLE EAST



* COUNTRIES INCLUDED IN EACH OF THE TWO REGIONS ARE THOSE TREATED IN THE ARTICLE ON PAGE 92

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